REMARKS

Claims 1-29 are now pending in this application. The Office action has been carefully considered. The Office action rejected claims 1-10, 13-27, and 29 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,470,482 to Rostoker et al., ("Rostoker") in view of U.S. Patent No. 5,956,023 to Lyle et al., ("Lyle"). Additionally, the Office action rejected claims 11 and 12 under 35 U.S.C. § 103(a) as being unpatentable over Rostoker in view of Lyle in further view of U.S. Patent No. 6,515, 656 to Wittenburg et al., ("Wittenburg"). Furthermore, the Office action rejected claim 28 under 35 U.S.C. § 103(a) as being unpatentable over Rostoker in view of Lyle in further view of U.S. Patent No. 6,418, 421 Hurtado et al., ("Hurtado"). Applicants respectfully disagree.

By present amendment, claims 1, 14, and 19 have been amended for clarification and not in view of the prior art. Applicants submit that the claims as filed were patentable over the prior art of record, and that the amendments herein are for purposes of clarifying the claims and/or for expediting allowance of the claims and not for reasons related to patentability. Reconsideration is respectfully requested.

Prior to discussing reasons why applicants believe that the claims in this application are clearly allowable in view of the teachings of the cited and applied references, a brief description of the present invention is presented.

The present invention is directed to a modeling layout algorithm in a computing environment having two engines. More specifically, within the present invention, a modeling engine and a layout engine work in conjunction with each

other to facilitate the emulation of electronic modeling elements in an electronic system design. As such, one embodiment is directed to enabling incremental and interruptible automatic layout operations (operations that are very time-consuming and resource-intensive) that are conducted between two specific engines called a layout engine and a modeling engine. Each of these engines work in conjunction with each other to provide an automatic layout process for the modeling of a specific electronic design, such as a microchip layout or a motherboard layout.

One embodiment further comprises a defined set of interfaces (*e.g.,* of a COM object) between a layout engine and a modeling engine. The modeling engine may call upon these interfaces to start and stop the layout process, preserve and restore state information, and perform other functions. Further, the layout engine, which may be a pluggable component in the computing environment, may raise events through another interface to indicate when the layout engine may be safely interrupted or to indicate progress. Then, the modeling engine may call back into the layout engine to stop the layout if the user has requested that the layout be interrupted. Using these interfaces between the modeling engine and various layout engines, one may interrupt a layout process while preserving and eventually restoring its state, thereby enabling incremental layout operations that do not lose progress.

Note that the above description is for example and informational purposes only, and should not be used to interpret the claims, which are discussed below.

Turning to the claims, amended claim 1 recites in a computing device, a system comprising a modeling engine for editing modeling elements, the modeling

engine connected to a user interface and operable to emulate an electronic system design having a plurality of electronic elements, a layout engine, the layout engine connected to the modeling engine and configured to execute an automatic layout process that automatically lays out modeling elements of the emulated electronic system design, and a set of at least one interface connecting the modeling engine to the layout engine, the set including at least one interface through which the modeling engine communicates with the layout engine to provide state-maintained user interaction with the automatic layout process other than to cancel the automatic layout process, wherein the layout engine may interrupt the automatic layout process at a first operational point and resume from the first operational point.

The Office action rejected claim 1 as being unpatentable over Rostoker in view of Lyle. More specifically, the Office action contends that Rostoker teaches a modeling engine for editing modeling elements, the modeling engine connected to a user interface and operable to emulate an electronic system design having a plurality of electronic elements. Fig. 9 and column 15, lines 14-53 of Rostoker are referenced. Further, the Office action contends that Rostoker teaches a layout engine, the layout engine connected to the modeling engine and configured to execute an automatic layout process that automatically lays out modeling elements of the emulated electronic system design. Fig. 9 and column 18, lines 29-68 of Rostoker are referenced.

The Office action correctly acknowledges that Rostoker fails to teach a set of at least one interface connecting the modeling engine to the layout engine, the

set including at least one interface through which the modeling engine communicates with the layout engine to provide state-maintained user interaction with the automatic layout process other than to cancel the automatic layout process. However, the Office action contends that Lyle does teach this recitation at column 10, lines 30-40. The Office action concludes that the recitations of claim 1 would have been obvious to one skilled in the art at the time the invention was made because the ability to pause and resume a process is desirable. Applicants respectfully disagree.

To establish *prima facie* obviousness of a claimed invention, all of the claim recitations must be taught or suggested by the prior art; (*In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)), and "all words in a claim must be considered in judging the patentability of that claim against the prior art;" (*In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)). Further, if prior art, in any material respect teaches away from the claimed invention, the art cannot be used to support an obviousness rejection. *In re Geisler*, 116 F.3d 1465, 1471, 43 USPQ2d 1362, 1366 (Fed Cir. 1997). Moreover, if a modification would render a reference unsatisfactory for its intended purpose, the suggested modification / combination is impermissible. See MPEP § 2143.01.

Applicants submit that the Office action has failed to establish a *prima facie* case for obviousness. Rostoker is directed, generally, to a system for simulating an electronic system that has been designed by a designer at a high-level language. More specifically, the cited and applied sections of Rostoker disclose several steps of a design process wherein design description, module description,

composition and verification steps within the context of an electronic system design are interpreted by the Office action to be a modeling engine. Further, Rostoker discloses a compiler that may be used to compile the high-level language used in the design steps to yield an implemented design in executable code. As correctly acknowledged by the Office action, Rostoker shows absolutely no cognizance of any mechanism, method, or interface that would allow the compiler to be interrupted in any manner while it is compiling. Indeed, Rostoker discloses that the user is limited to providing user interaction *only during an edit mode which is mutually exclusive from the compile mode*. Thus, Rostoker does not envision being able to stop (much less start again) the compiling process once engaged.

Lyle does not cure this deficiency. The cited and applied sections of Lyle disclose a Pause/End button to which any "currently operating clinical procedure" may be paused, restarted, or ended. While Lyle teaches some form of a Pause/End communication, this is wholly unrelated to any layout engine or modeling engine as recited in claim 1. The Lyle reference may have just as easily been a CD player with a Pause/Play button, which indicates that some "currently operating clinical procedure" may be paused, restarted, or ended. As has been pointed out in previous Office action responses, Lyle does not teach a modeling engine or a layout engine; it is wholly non-analogous art. This argument has been explicitly acknowledged as correct by the fact that the Office action turned to the Rostoker reference in a contention of teaching a layout engine and a modeling engine. Since Rostoker clearly teaches away from the present invention, the logic

behind combining these references is erroneous as a matter of law, and is clearly based on hindsight reasoning gleaned solely from applicants' teachings.

Further, in order to support a § 103(a) rejection, there must be some teaching, suggestion, or motivation other than applicants' teachings for modifying a cited reference or combining references to achieve the claim as recited. The Office action does not indicate any suggestion or motivation in the prior art of record, either explicit or otherwise, for modifying the references or combining the references in a manner that would achieve the claim as recited, or point out any teaching as to how such a modification or combination might be accomplished, or what might be accomplished thereby other than a blanket statement that it is desirable to do so. Such an end, *i.e.*, desirability of an outcome, is impermissibly broad and conclusory. Such broad, conclusory statements do not come close to adequately addressing the issue of motivation to combine, are not evidence of obviousness, and therefore are improper as a matter of law. *In re Dembiczak*, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999).

Furthermore, even if the references were somehow combinable in the manner suggested by the Office action (which they are not), they would still fail to teach a system including an interface through which the modeling engine communicates with the layout engine to provide state-maintained user interaction with the automatic layout process other than to cancel the automatic layout process as recited in claim 1.

Notwithstanding these arguments, claim 1 has been amended to recite wherein the layout engine may interrupt the automatic layout process at a first

operational point and resume from the first operational point. Certainly neither Rostoker nor Lyle teaches a system that may implement a layout process, within the context of a modeling engine and a layout engine working in conjunction with each other, wherein the layout process may be interrupted and resumed from the same point in the process. At least for this additional reason, applicants submit that claim 1 is patentable over the cited references.

Applicants respectfully submit that dependent claims 2-13, by similar analysis, are allowable. Each of these claims depends either directly or indirectly from claim 1 and consequently includes the recitations of independent claim 1. As discussed above, Rostoker and Lyle, whether considered individually or in any permissible combination with each other, fail to teach or suggest the recitations of claim 1. Even when additional prior art is introduced, such as in the case of Wittenburg with claims 11 and 12, the prior art of record still fails to teach or suggest the recitations of claim 1. Therefore, these claims are also allowable over the prior art of record. In addition to the recitations of claim 1 noted above, each of these dependent claims includes additional patentable elements.

Turning to the next independent claim, amended claim 14 recites a computer-implemented method, comprising starting a layout engine to lay out electronic model elements that are part of an emulated electronic system, receiving information from the layout engine indicating that it can be safely interrupted within a current state, and interrupting the layout engine in the current state based on the information, such that an automatic layout process may be interrupted at a first operational point and resume from the first operational point.

The Office action rejected claim 14 as being unpatentable over Rostoker in view of Lyle. In specific, the Office action cites the exact same sections of Rostoker and Lyle as were cited with respect to the rejection of claim 1. Thus, the Office action similarly concludes that the recitations of claims 14 would have been obvious to a person skilled in the art at the time the invention was made because providing a user the ability to start and stop a process is desirable. Applicants respectfully disagree.

Applicants submit that the Office action has failed to establish a *prima facie* case for obviousness. As discussed above, Rostoker is directed, generally, to a system for simulating an electronic system that has been designed by a designer at a high-level language. More specifically, the cited and applied sections of Rostoker disclose several steps of a design process wherein design description, module description, composition and verification steps within the context of an electronic system design are interpreted by the Office action to be a modeling engine. Further, Rostoker discloses a compiler that may be used to compile the high-level language used in the design steps to yield an implemented design in executable code.

Again, as correctly acknowledged by the Office action, Rostoker shows absolutely no cognizance of any mechanism, method, or interface that would allow the compiler to be interrupted in any manner while it is compiling. That is, Rostoker discloses that the user is limited to providing user interaction only during an edit mode which is mutually exclusive from the compile mode. Thus, Rostoker does not envision being able to stop (much less start again) the compiling process once

engaged. Specifically not being allowed to interrupt a process by design certainly precludes any modification that turns right around and interrupts the process. Clearly, Rostoker teaches away from the present invention.

Lyle does not cure this deficiency of providing a means for interrupting a layout process. Despite the applied sections of Lyle disclosing a Pause/End button, this button is wholly unrelated to any layout engine or modeling engine as recited in claim 1. It is settled that Lyle does not teach a modeling engine and a layout engine; these are recitations that must be considered in their proper context in claim 1. Without this context, the Lyle reference could just as easily be a CD player with a Pause/Play button, which may interrupt any process. It is the context, *i.e.*, an automatic layout process as implemented via a modeling engine and a layout engine, which may be interrupted and resumed from the same point. Thus, not only do the references teach away from each other, the motivation to combine is flat wrong, which results in the logic behind combining these references being erroneous as a matter of law.

The Office action does not indicate any suggestion or motivation in the prior art of record, other than the desirability of being able to interrupt the process, for modifying the references or combining the references in a manner that would achieve the claim as recited. Such a motivation, *i.e.*, desirability of an outcome, is impermissibly broad and conclusory. Such broad, conclusory statements do not come close to adequately addressing the issue of motivation to combine, are not evidence of obviousness, and therefore are improper as a matter of law. *In re Dembiczak*, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999).

Furthermore, even if the references were somehow combinable in the manner suggested by the Office action (which they are not), they would still fail to teach a system including an interface through which the modeling engine communicates with the layout engine to provide state-maintained user interaction with the automatic layout process other than to cancel the automatic layout process as recited in claim 1.

Notwithstanding these arguments, claim 14 has been amended to recite that the layout engine may interrupt the automatic layout process at a first operational point and resume from the first operational point. Certainly, neither Rostoker nor Lyle teaches a system that may implement a layout process, within the context of a modeling engine and a layout engine working in conjunction with each other, wherein the layout process may be interrupted and resumed from the same point in the process. At least for this additional reason, applicants submit that claim 14 is patentable over the cited references.

Applicants respectfully submit that dependent claims 15-18, by similar analysis, are allowable. Each of these claims depends either directly or indirectly from claim 14 and consequently includes the recitations of independent claim 14. As discussed above, Rostoker and Lyle, whether considered individually or in any permissible combination with each other, fail to teach or suggest the recitations of claim 14. Therefore, these claims are also allowable over the prior art of record. In addition to the recitations of claim 14 noted above, each of these dependent claims includes additional patentable elements.

Turning to the last independent claim, amended claim 19 recites a computer-implemented method, comprising starting a layout engine to lay out electronic model elements that are part of an emulated electronic system, providing information to the layout engine by which the layout engine preserves state information, interrupting the layout engine, such that a layout process may be interrupted at a first operational point and resume from the first operational point, providing information to the layout engine by which the layout engine restores state from the state information, and restarting the layout engine from the restored state.

The Office action rejected claim 19 as being unpatentable over Rostoker in view of Lyle. In specific, the Office action cites the exact same sections of Rostoker and Lyle as were cited with respect to the rejection of claim 1. Thus, the Office action similarly concludes that the recitations of claims 19 would have been obvious to a person skilled in the art at the time the invention was made because providing a user the ability to start and stop a process is desirable. Applicants respectfully disagree.

Applicants submit that the Office action has failed to establish a *prima facie* case for obviousness. As discussed above, Rostoker is directed, generally, to a system for simulating an electronic system that has been designed by a designer at a high-level language. However, as correctly acknowledged by the Office action, Rostoker shows absolutely no cognizance of any mechanism, method, or interface that would allow the compile process to be interrupted in any manner while it is compiling. That is, Rostoker discloses that the user is limited to providing user

interaction only during an edit mode which is mutually exclusive from the compile mode. Clearly, Rostoker teaches away from the present invention in this manner.

Further, Lyle does not cure this deficiency of providing a means for interrupting a layout process. Despite the applied sections of Lyle disclosing a Pause/End button, this button is wholly unrelated to any layout engine or modeling engine as recited in claim 19. It is settled that Lyle does not teach a modeling engine and a layout engine, recitations that must be considered in their proper context in claim 19. Therefore, the logic behind combining these references is erroneous as a matter of law.

The Office action does not indicate any suggestion or motivation in the prior art of record, other than the desirability of being able to interrupt the process, for modifying the references or combining the references in a manner that would achieve the claim as recited. Such broad, conclusory statements do not come close to adequately addressing the issue of motivation to combine, are not evidence of obviousness, and therefore are improper as a matter of law. *In re Dembiczak*, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999).

Notwithstanding these arguments, claim 19 has been amended to recite that the layout engine may interrupt the automatic layout process at a first operational point and resume from the first operational point. Certainly, neither Rostoker nor Lyle teaches a system that may implement a layout process, within the context of a modeling engine and a layout engine working in conjunction with each other, wherein the layout process may be interrupted and resumed from the same point in

the process. At least for this additional reason, applicants submit that claim 19 is patentable over the cited references.

Applicants respectfully submit that dependent claims 20-29, by similar analysis, are allowable. Each of these claims depends either directly or indirectly from claim 19 and consequently includes the recitations of independent claim 19. As discussed above, Rostoker and Lyle, whether considered individually or in any permissible combination with each other, fail to teach or suggest the recitations of claim 19. Even when additional prior art is introduced, such as in the case of Hurtado with claim 28, the prior art of record still fails to teach or suggest the recitations of claim 19. Therefore, these claims are also allowable over the prior art of record. In addition to the recitations of claim 19 noted above, each of these dependent claims includes additional patentable elements.

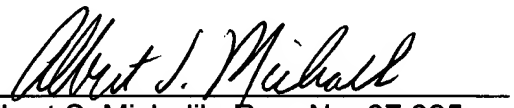
For at least these additional reasons, applicants submit that all the claims are patentable over the prior art of record. Reconsideration and withdrawal of the rejections in the Office action is respectfully requested and early allowance of this application is earnestly solicited.

CONCLUSION

In view of the foregoing remarks, it is respectfully submitted that claims 1-29 are patentable over the prior art of record, and that the application is in good and proper form for allowance. A favorable action on the part of the Examiner is earnestly solicited.

If in the opinion of the Examiner a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney at (425) 836-3030.

Respectfully submitted,



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In re Application of Rajarajan et al.
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CERTIFICATE OF MAILING

I hereby certify that this Amendment, along with RCE transmittal, and Credit Card Payment Form are being deposited with the United States Postal Service on the date shown below with sufficient postage as First Class Mail in an envelope addressed to: Commissioner for Patents, Alexandria, VA 22313-1450.

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Albert S. Michalik

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